Introduction

At the conclusion of the Second Transportation Research Board Conference on Performance Measurement in 2004, Lance Neumann, the Conference Co-Chair observed how performance measurement could serve as a communication tool. At that time, however, research gaps included understanding how performance measurement influences behavior, methods for reporting performance measurements and difficulties communicating risk (Turnbell 2005).

This paper relates and builds on summary conclusions from the 2004 conference. It provides examples of subsequent research and transportation agency practices that respond to previously identified gaps. The paper also references research relevant to but not specific to transportation. These examples are intended to reinforce certain points by noting that other industries apply similar approaches. In some cases, the non-transportation examples suggest alternate approaches or fill in gaps in the literature and, thus, are intended to expand what practitioners within the transportation industry may consider applying to their own circumstances.

In the end, the paper attempts to explain the value of public engagement in the development and implementation of performance measurement programs for the public agencies responsible for surface transportation. It also shows progress in each of the three areas identified as research gaps in 2004: assessing impacts of communication, communication methods and risk communication.

The paper is divided into six parts: each outlining a different concept or set of examples and each building on the previous topic:

1. Why Communicate Performance Measurement?
2. The Public, Customers and Market Segmentation
3. Partnerships, Two-Way Communication and Concepts of Integration
4. Perceived Value of Customer Communication
5. Assessing Impacts of Customer Communication
6. Communication Methods: The Nuts and Bolts

Why Communicate Performance Measurement?

While many of the people reading this paper may have a preconceived notion that they should communicate performance with the public (a view that now also may be broadly held by transportation agencies), it still is important to describe the basis for this belief.

Research literature suggests the following seven reasons for communication of performance measurement. (In reality, communication is a mix of one or more of the reasons.)

- Legislative Direction – The I-95 Corridor Coalition conducted a surveyed of its members about the use of performance measurement; one of the questions asked about communication with legislators about performance (2005); few member agencies responded they were communicating performance to legislators. While not commonly noted as a reason for communicating performance (perhaps, because it is obvious) Padgette (2006) wrote about the importance of reporting performance measurement in response to legislative demands. In some cases this is a direct reflection of a legislative mandate. In other cases, proactive communication with advisory boards and oversight agencies can help guide the types of questions that they may ask of the agency. Communication can clarify and even lead to shared assumptions about realistic program outcomes and controls. Emerson and Carlson (2003) writing about the measurement of environmental conflict resolution programs note similarly that administrative and legislative bodies are important audiences.

- Public Awareness – Communicating performance can educate the public of agency priorities or manage expectations by describing challenges and external influences that impact transportation programs. Public awareness was a specific component of the design of the annual Metropolitan Atlanta Performance Report prepared by the Georgia Regional Transportation Authority (2007). In regard to non-traditional measures, over which transportation agencies frequently have shared or limited control, Hendren (2006) noted the importance of education. Similarly, in the environmental sector, GAO (2004) found that after assessing conditions and trends the most frequently citied reason for performance measurement among federal, state and regional organizations was educate the audience, raise awareness and communicate complex issues, in descending order.

- Support for New Revenue – A report for Transport Canada (2006) suggested that performance measurements can provide data to justify program expenditures, support requests for allocation of additional resources and public agency demands for greater accountability as reasons for applying performance measurement, at least, in regard to communicating with the public. Hendren (2006) also noted that demonstrating performance is important when seeking revenue. Cameron et. al. (2003) suggested that communicating performance measurement is important for gaining stakeholder trust particularly when agencies are seeking funding and raising awareness of agency priorities.

- Customer Feedback – Communication is a two-way street; it allows agencies to gain input and guidance on how and what to communicate about performance as well as provide information about performance. Schaller (2005) noted that customer communication is one of five reasons that transit agencies conduct surveys. Hendren (2006) suggested a shift from system focus to customer focus in non-traditional performance measurement and the importance of customer feedback. Stein (2003)

wrote about keeping customers informed to demonstrate that agencies are providing transportation services that meet customer needs.

- Accountability – Padgette (2006) wrote that in several departments of transportation senior leadership provides information to the public on performance as a means to reinforce accountability. Accountability can be considered analogous to legislative reporting for a more general audience. Virginia Department of Transportation is a good example (which will be described in more detail below) of the importance of reporting performance measurement in public accountability. Hendren (2006) similarly noted accountability and credibility as an important issue relating to non-traditional performance measurements, which include measurements of interest to other agencies and public groups such as land use, environment or quality of life.

- Trust Building – Cameron et. al. (2003) suggested that communicating performance measurement is important for gaining stakeholder trust. Trust building requires transparency and accountability. Missouri DOT identified transparency as important reasons behind communication with the public on their Tracker performance measurement report (2007). A NCHRP Report (2004a) noted that New Mexico Department of Transportation's commitment to an open and public process in regarding to performance commitments in the environmental management area. Virginia DOT found accountability an important element of communicating performance (Jones 2007).

- Collaboration – Missouri DOT noted creating opportunities for collaboration as another important reason behind communication with the public on their Tracker performance measurement report (2007). However, Missouri appears unusual in the research and among agency performance measurement programs by naming collaboration as a reason. This issue will be discussed further in the section on Partnerships below.

The Public, Customers and Market Segmentation

As noted in the section above, agencies reference a variety of audiences when describing the purpose of communicating performance. In this regard, customers may include any external audience: decision-makers, partner agencies, commuters, residents and visitors. For example, the Florida Department of Transportation conducted customer surveys of residents, local officials, visitors, seniors and commercial divers (Florida DOT 2005). The Michigan Transportation Summit provides another example. Michigan engaged multiple segments of the public and business in the development of the Department's strategic plan. Schwartz (2006) noted that this effort goes beyond surveying customer satisfaction after goals and measures are developed.

Schwartz (2006) and Stein (2003) differentiated between stakeholders, partners and customers. Stein (2003) went on to describe the value of segmenting customers and discussed societal changes that have lead to increased segmentation for transportation based on geography, demographics, travel behavior and socioeconomics. Schaller (2005) also noted the importance of customer segmentation specific to transit service including the value of segmentation when communicating with different customer groups.

This paper takes a broader view of customers including both external audiences and in some instances within very large organizations internal audiences. This seems consistent with the approach taken by several state departments of transportation while others (Florida 2006) do divide customers into multiple segments. While methods may vary for different segments as described in the final section of this paper, the importance of communicating performance may be similar regardless of the audience.

Used frequently in private industry, the American Customer Satisfaction Index (ACSI) is one method for inferring the quality of communications with groups in the areas of transportation services. The ASCI compares customer expectations and perceptions of service quality. The measurements allow for a correlation between expectation and perceived quality, which leads to customer satisfaction.

Van Ryzin et. al. (2004) described how the City of New York applied the ASCI to government performance in areas including road smoothness, street cleanliness, subway service and bus service. New York City is well known for diversity; the data captured by ACSI allowed for segmentation of the results by geography (each Borough), race-ethnicity and income. In this example, the City of New York was interested in providing city leadership with information about how resident satisfaction correlated with confidence and trust in government services. Overall, road conditions were a strong driver of the overall perceived quality of and public satisfaction with city services. Transit services, on the other hand, appear to matter more to residents in outer boroughs and those with lower incomes.

The ACSI was not designed to assess public confidence or trust, however; Van Ryzin et. al. (2004) noted that about one-sixth of the variation in confidence was captured by the ACSI. Public appreciation of agency control (or lack thereof) and external factors can cloud results. The public may not hold an agency accountable for conditions or attribute outcomes to actions taken by the agency. This can allow the ACSI or similar survey instruments useful approaches for measuring either changes in service quality or communication that could appreciably modify expectations among the general public of segments of the population.

Partnerships: Two-Way Communication and Concepts of Integration

Surprisingly, it appears that few agencies have considered or embraced communication of performance measurement for the purpose of seeking cooperation and building partnerships although both Klein (2005) spoke about integrating measurement across agencies, and Joshua (2005) talked about how a metropolitan planning organization can use its formal structure of a policy board and advisory committees to engage customers in the development of performance measurement at the 2004 TRB Performance Measurement Conference.

Some examples exist in the area of non-traditional measures such as environmental measures. Hendren (2006), in writing about non-traditional, transportation performance measures, noted that the measures may be outside the typical control of transportation agencies. It is in these cases where partnerships may be of particular importance (e.g. energy and resource conservation; environmental quality; quality of life; or sustainability.) "Chapter 2: Organizational Environmental Stewardship Practices" of Environmental Stewardship Practices, Policies, and Procedures for Road Construction and Maintenance discussed partnerships and shared reporting between agencies and industry in the measurement of environmental mitigations (NCHRP 2006). Likewise, a report of context sensitive solutions (NCHRP 2004) discussed the collaborative aspect of performance measurement. Performance measurements may be linked to local land use and community needs so there is increased reason to collaborate.

Transportation agencies are increasingly directed to deliver transportation system integrated with other systems such as land use or environment ecosystems. Groups that may be involved in partnering with transportation agencies in the area of performance measurement include other transportation agencies such as public transportation providers or ports. Non-traditional measures areas fall outside the jurisdiction of transportation agencies (e.g., health). These measures could lead to new collaboration among agencies. It may include stakeholders with a more narrow interest in the transportation program such as air quality districts, public and traffic safety organizations, health providers or land use and environmental regulatory agencies. It also may include non-governmental organizations and advisory groups.

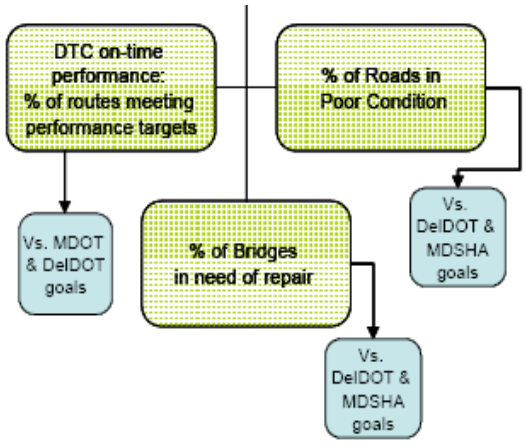


Figure 1: From the WILMAPCO draft long-range plan; see http://www.wilmapco.org/RTP/Update.htm

The Wilmington Area Planning Council (WILMAPCO), the designated metropolitan planning organization for the Willington, Delaware area provided an example of partnering and coordination. The metropolitan area includes parts of Delaware and Maryland. The MPO developed a long-range plan that brought together performance measurement data and information from multiple agencies in the long-range transportation plan, meshing goals from Delaware department of transportation (DelDOT) and Maryland State Highway Administration for road and bridge conditions and between Maryland Department of Transportation and DelDOT for on-time transit performance. See Figure 1.

When thinking of how communicating performance measurement may aid in building partnerships, it may be helpful to consider communication in the shape of an hourglass with the width being the level of effort or engagement outside the organization and the length of the hourglass as time. See Figure 2.[1]

Communication with external organizations on performance measurement frequently starts with extensive engagement; communication then decreases as an organization works internally to develop implement or modify a performance measurement program; communication again becomes extensive as the organization reports and discusses the results.

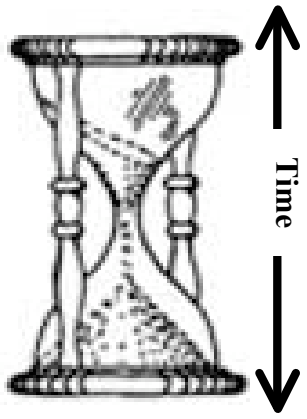


Figure 2: The Hourglass of Communication starting with broad input, narrowing then finishing with broad output

An illustration of this is from the Delaware Valley Regional Planning Commission (DVRPC), which is the designated metropolitan planning organization for the Philadelphia, PA-Camden, NJ area. The DVRPC used a steering committee to incorporate feedback from external sources into the performance measurement program (DVRPC 2006).

Another example of agency and stakeholder partnership in developing performance measurement is the Sustainable Region Showcase for Greater Vancouver, British Columbia, which developed diverse measures including transit and pedestrian priority, hybrid buses, a greenway, transit villages, goods movement and household-based marketing (Transportation Association of Canada 2006).

At the output end of the hourglass, is the Smart Commute Initiative (2003) in the greater Toronto area, a public-private transportation demand management organization, which used the partnership to increase the dissemination and discussion of regional performance measures. The Smart Commute Initiative included demand-strategies that are

[1] Zoe Neaderland of DVRPC introduced the author to the analogy.

measurable, developed and implemented across multiple jurisdictions and by both public and private partners. It was intended to link the system performance at the regional and local levels.

The Smart Commute Initiative also illustrated another way to look at communicating performance measurement: communication may vertical (between one office and the larger organization or between a local agency and a regional council of governments) or horizontal (among local agencies). WILMAPCO demonstrated an example of vertical communication, between local agencies and the metropolitan planning organization and between the metropolitan planning organization and statewide measurements in Delaware and Maryland. NCHRP (2004) described a case of vertical integration between micro (project-level) and macro (agency-wide) measures for context sensitive design. Emerson and Carlson (2003) also noted the use of benchmarking of environmental conflict resolution programs to demonstrate aggregate outcomes, an example of horizontal integration, which required coordination, quality control and clarity regarding data management. A final example of horizontal integration is from the Baltimore Neighborhood Indicators Alliance (2006). The Alliance reported on indicators such as travel time, mode split by neighborhood to an audience of the general public and policy makers with the purpose of influencing government programs.

Perceived Value of Customer Communication

Behind the reasons for communicating performance (legislative direction, public awareness, etc.), agencies and their employees anticipate some benefit. The Virginia Department of Transportation is an example of an agency that found a clear benefit in effectively communicating performance. Before adopting current performance measurement practices the public and media were skeptical of Virginia Department of Transportation's performance (Jones 2007). This led to the Department focusing on program delivery and adopting new reporting mechanisms for performance using a dashboard. (See Figure 5.) The new focus and performance reporting increased Department credibility and improved press coverage.

The Missouri Department of Transportation found value in communicating performance as well. The Department measured the percent of customers who view the Department as Missouri's transportation expert (Tracker 2007), which the Department found demonstrated public credibility. More interesting is the Department's measurement of the percent of federal earmarked highway projects on the state highway system. This is designed as a similar indicator of credibility among a much smaller group, the State's Congressional delegation.

The Missouri Department of Transportation also tracks more typical measures of customer involvement in transportation decision-making as well as the percent of customers who felt that the Department included them in transportation decision-making

process. Again, these measures illustrate an underlying basis for building public trust and confidence.

The City of Baltimore provides another example. The City developed CitiStat to manage day-to-day operations of city departments. CitiStat employed a database to develop common maps, charts and graphs showing agency performance. For transportation, performance included snow removal, street light repairs and curb lane closures. The mayor and other executives meet bi-weekly to review performance. One unexpected result of the system was learning that the city responded to most pothole complaints within 48-hours. The mayor announced a public campaign promising responsiveness to pothole complaints, which the city already was doing. This led to increased public confidence and trust in city services (Baxandall and Euchner, 2003).

A final example is the Canadian Smart Commute Initiative (2003), which included development of assessment tool for tracking stakeholders and public. The initiative considered benchmarking, regular monitoring and public reporting as important methods for sustaining program goals.

> "A major legacy to which the Smart Commute Initiative aspires is to firmly establish the value of TDM measures in the public's mind and travel culture to such an extent that there will continue to be widespread municipal and private sector support to maintain and expand these programs beyond the timeframe of the Showcase Program. Reporting accomplishments on an annual basis provides the Smart Commute Initiative the opportunity to measure its success at reaching this major goal."

While it is too early to tell if the Smart Commute Initiate was able to build value by discussing performance with customers, Wang and Wart (2007) provided an interesting and perhaps important consideration about the relationship between trust and public communication. They conducted a national assessment of larger local governments in the United States, which identified important intermediate considerations that link public participation and increased trust. Transportation was one of 10 functions and fell in the middle in terms of public involvement in local government with general land use, recreation and public safety more frequently topics of involvement. The most frequent process was program goals and objectives.

Wang and Wart (2007) started with considering the assumptions behind linking participation and trust, which they noted is widely accepted in political science literature. They then tested five distinct intermediate factors commonly identified. They found the most important intermediate element in contributing to increased public trust was service competence. Public trust as defined in their article is a broad sense that government will deliver what is needed as opposed to satisfaction with a specific action or good or service.

Service competence suggests that the public trusts agencies more when agencies can demonstrate that response for services consistently is well met. They suggest that fulfillment and demonstrating delivery of results are critical to building trust.

Wang and Wart noted that there is a strong correlation between increase public interaction and accountability but that does not translate into increase trust. They hypothesized that information alone does not change public attitude or perceptions about government. They also note that public communication can support legitimacy of public actions, which is separate from trust. Based on their research, transportation agencies may want to be cautious about using communication as a means of trust building.

Assessing Impact of Customer Communication

ACSI and similar methods for assessing customer impact use a quadrant analysis, which compares satisfaction with importance (Van Ryzin et. al. 2004). The Federal Highway Administration provides an example of quadrant analysis to support agency performance measurement based on national survey of travelers in 2005. In a quadrant analysis, the upper right quadrant shows programs that customers found both satisfactory and important; going clockwise, the next quadrant contains programs that customer found unsatisfactory and important; the next quadrant contains programs that customers found unsatisfactory but unimportant; and the final quadrant contains programs that customers found satisfactory but less important. (See Figure 3.)

		Importance	
		Low	High
Overall Grade	High	Secondary Strengths	Primary Strengths
	Low	Potential Weaknesses	Critical Weaknesses

Figure 3: Typical Quadrant Analysis

As important as noting which quadrant an agency program or activity falls is the fit between agency resources and the combination of customer satisfaction and importance. Accordingly, one method for assessing impact from customer communication is the ability to match agency resources correctly to the combination of importance and perceived quality. (See figure 4.) The further a program tangentially is below the diagonal line, the more the public sees the agency as underperforming.

Schwartz (2006) makes a good argument for the value of customer communication. Based on a review of cases in state departments of transportation, metropolitan planning organizations and public transit providers, she found that engaging with a broad range of stakeholders not only can increase public trust but also can lead to actual changes in programs.

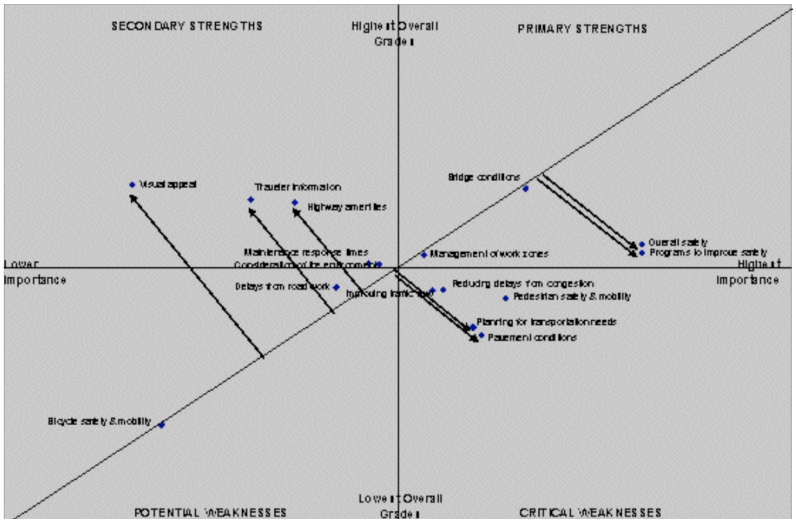


Figure 4: The diagonal line highlights the best fit of resources

This builds on a presentation at the prior TRB Conference on Performance Measurement that discussed resource allocation and program impact based on customer understanding. This is part of the two-way discussion agencies have with customers about performance through market research (Halverson 2005).

Communication Methods

The final section of the paper is not intended as an afterthought; the paper finishes with communication techniques to reinforce methods as a culmination or implementation of understanding the value of customer communication.

When considering how to communicate it is important to return to the idea of audience segmentation. For technical audiences that may include other transportation agencies, communication should include details. For officials, communication techniques should provide decision support. For the public and the media, the impact of the performance measurement should be apparent.

Generally for non-technical audiences, agencies have used the following methods to communicate performance:

- Simple charts and tables
- Dashboards, score cards and report cards
- System maps
- Narrative

These methods of communicating agency performance may be included in publications, brochures, executive summaries, full reports, and on posters. They may be reported at meetings and in presentations. They also may be sent to the media or contact lists for different groups of customers, stakeholders and interested parties.

Besides the method used to report performance to customers another consideration is the frequency of communication. Padgette (2006) mentioned that regularity of reporting might be more important than format. Report cards tend to be annual activities while dashboards and interactive maps can show more frequent and operational measurements (I-95 Corridor Coalition, 2005a). The Coalition report (2005a) and GAO (2004) also raised cautions about the time lag of annual reporting.

Based on collected information from Provincial and Territorial transportation agencies in Canada (Transport Association of Canada 2006), it appears that performance measurement information in Canada is available to the public mostly through annual reports. For an example of an annual report, Austin, Texas has been effective at using a Community Scorecard to report performance. (ICMA) Austin reports on transportation as well as other municipal functions using a scorecard for quick comparison across time and across departments.

While reporting methods was identified as one of the research gaps in 2004, Larson (2005) also mentioned the use of geographic information systems (GIS) and dashboards to communicate performance to customers, which suggests that the practices existed but were not widely adopted. Since then Lindley (2005) made the point that the data methods can be complex to the point that customers may not have the knowledge to understand the method; nonetheless, they can understand the importance of the measure if it is communicated well. Reinforcing this concept is the report on environmental indicators (GAO 2004). The report discusses at length the important of communicating complex concepts such as risk among agencies and to the public and decision makers.

One example of reporting that is easy to understand even when relating complex information is the use of dashboards. Padgette (2006) found that some departments of transportation used automated data management systems to provide performance information on dashboards that were accessible to agency leadership, legislators, stakeholders and the general public. Cameron et. al (2005) also mentioned the use of dashboards to articulate performance to external stakeholders. (See Figure 5.)

The number of current examples suggests that knowledge about methods for performance reporting is more widely applied today than in 2004. One exemplary instance is the Kansas Department of Transportation, which won a National Partnership for Highway Quality award for the Kansas City Scout, which reports system performance. (See Figure 6.) The award noted that the Department was effective not only supporting the development of system measures of congestion but at building partnerships with the media to get the information to the public (NPHQ 2006).

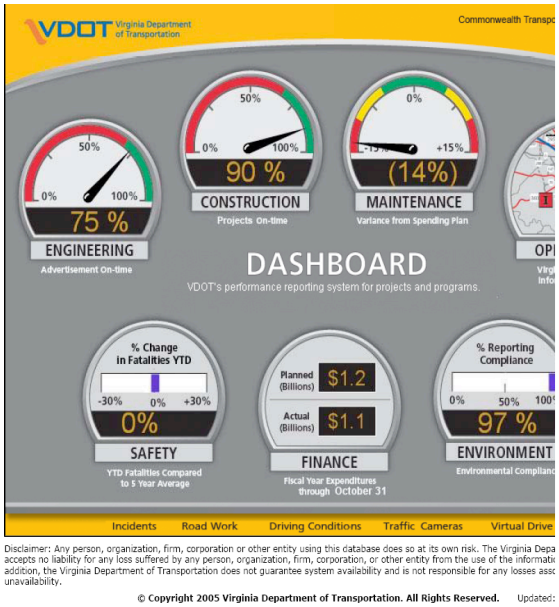
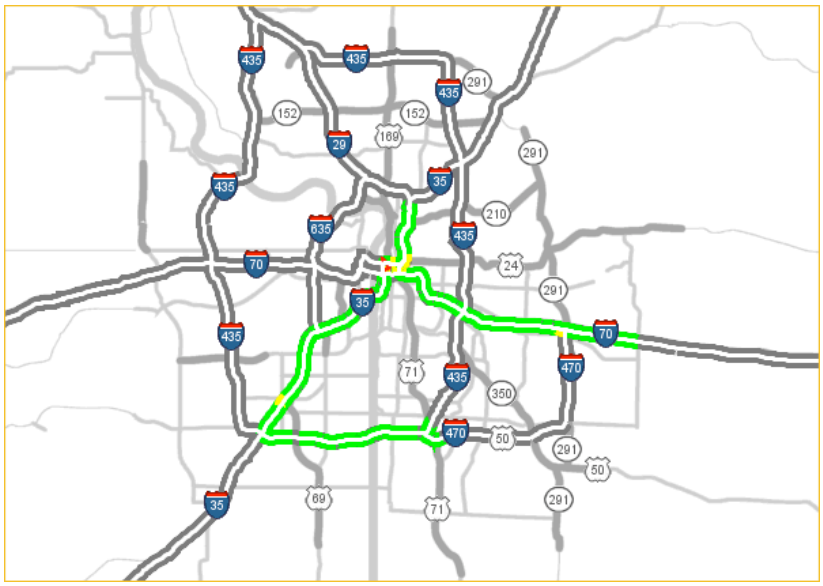


Figure 5: A detail of the Virginia DOT Dashboard found at http://dashboard.virginiadot.org/default.aspx

Similarly, the Smart Commute Initiative (2003) in the Toronto region of Ontario included forms of public outreach in the development of common measurable strategies including a one-day retreat by a public-private working group, a stakeholders' breakfast to provide initial information. The Smart Commute Initiative also used of incentives and awards that lead to media coverage and participated in a national information network to promote coordination with external stakeholders.



Generally, using an appropriate method to create a straightforward message about performance and an appropriate method to reach a specific audience appears to be the keys to communicating with customers and other important external groups.

Figure 6: Display of current system operations viewed at www.kcscout.net

Research Methodology and Key Words

In researching the paper, the author conducted a comprehensive review of English language research related to the subject at hand: communicating surface transportation agency performance measurement with the public. The author reviewed bibliographies collected by the TRB Performance Measurement Committee, reviewed recent transportation performance measurement discussion boards and searched the transportation research information system (TRIS), Research in Progress (RIP) database and conducted limited Internet searches using the following key words: Measures of effectiveness, performance measurement, public involvement, public participation, public opinion.

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